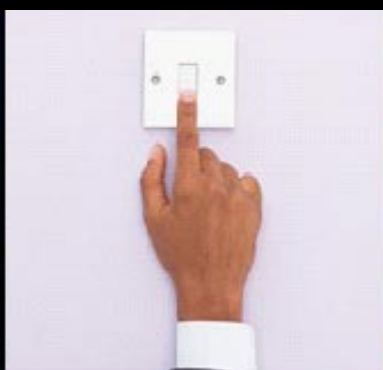




Annual Report 2006-2007

Prepared by the
South Carolina Energy Office
State Budget and Control Board

For Submission to the
South Carolina
Energy Advisory Committee



Message from the Director



Because we depend on energy so much, we often take it for granted. Only in times of emergency, such as the oil crisis in 1973 and the more recent impacts from Hurricanes Katrina and Rita, do we fully realize its importance and understand how susceptible our energy supply is to disruption by natural disasters and outside forces.

South Carolina spends almost \$18 billion annually on energy costs, some of which is the result of wasteful energy practices. Through conservation and better energy efficiency, this wasted money can be saved and put to more productive uses in our state's economy.

In addition, emissions from energy production, such as sulfur dioxide, nitrogen oxide, and carbon dioxide, often have adverse effects on our personal health, resulting in higher health care costs as well as causing serious harm to the environment. Energy conservation and use of renewable energy resources can reduce the harmful health and environmental effects of energy use. Conservation of energy also has positive economic benefits because money not spent on energy can be spent on other South Carolina goods and services. Renewable energy resources produced in South Carolina, such as wood waste, landfill gas and biodiesel, provide jobs and strengthen our state's economy.

To address these issues, the 1992 South Carolina Energy Conservation and Efficiency Act established the South Carolina Energy Office (SCEO) as a part of the State Budget and Control Board. The SCEO carries out the state policy and program mandates of the Act and also administers the State Energy Program funded by the US Department of Energy. Additionally, we carry out substantial functions related to radioactive waste disposal mandated by legislation passed by the General Assembly in 2000.

The Fiscal Year 2007 Annual Report summarizes some of the accomplishments of the South Carolina Energy Office in its mission to increase energy efficiency and diversity, enhance environmental quality and save energy dollars for South Carolina.

John F. Clark
Director, South Carolina Energy Office
State Budget and Control Board

Table of ContentsFiscal Year 2007 South Carolina Energy Office

Renewable Energy Resources	Page 3
Facilities	Page 8
Transportation	Page 16
Public Information and Service	Page 19
Radioactive Waste Disposal Program	Page 22
Funding and Administration	Page 25

Renewable Energy Resources

The South Carolina Energy Office (SCEO) promotes renewable energy and sustainable development practices throughout the state to offset and replace traditional methods of energy production and consumption in order to mitigate environmental degradation and to promote economic development. Many of the SCEO programs are highlighted in this section.



Biomass Energy: The SCEO successfully completed a two-year federal biomass grant awarded by the US Department of Energy/Southeast Biomass State and Regional Partnership.

The South Carolina Biomass Council (SCBC) was established in April 2006 as part of grant activities. A major accomplishment of SCBC was the development of state policy recommendations created through a series of committee meetings. The SCEO coordinated over 40 meetings with nearly 100 stakeholders to develop a set of recommendations that were finalized in January 2007. The recommendations were eventually written into a bill, the "Energy Freedom and Rural Development Act," introduced by Representative Billy Witherspoon as H.3649. In the last days of the South Carolina General Assembly, the language of H.3649 was passed as part of two other bills. The SCEO also created the SCBC website, helped to form an Executive Committee, wrote the by-laws, and developed a membership dues structure in order for the SC Biomass Council to operate without funds from the Biomass Grant. The SCBC represents a significant accomplishment to promote biomass utilization in South Carolina.

Strategic and Tactical Research on Energy Independence Commission (STREIC): The formation of the Strategic and Tactical Research on Energy Independence Commission (STREIC) by the South Carolina General Assembly in FY06 provided a forum to create incentives and overcome barriers for biomass energy with the express mission to reduce dependence on petroleum and enhance state economic development. STREIC was staffed by the SCEO and chaired by Dr. Nick Rigas. Serving on the seven-member commission were four legislative appointees (selected by the Speaker of the House, the Chair of the House Ways and Means Committee, the Speaker Pro Tempore of the Senate, and the Chair of the Senate Finance Committee), one Governor appointee, the Agriculture Commissioner, and the Director of the South Carolina Institute for Energy Studies. The commission included representatives from the environmental, energy, business, and research institution fields. The final report of the commission was released January 2007 and played a crucial role in developing support of state legislators for the Energy Freedom and Rural Development Act.

Renewable Energy Legislative Victory: As the 2007 legislative session drew to a close, the South Carolina General Assembly passed sweeping incentives for development, production and use of renewable energy, in addition to energy efficiency incentives, in what has turned out to be the biggest year for energy legislation since 1992.

Several key pieces of legislation were passed in the final weeks of the South Carolina General Assembly that provided millions of dollars for biomass energy, renewable fuels, solar, wind, and energy efficient vehicles and buildings. The SCEO played a major role in writing, editing, and interpreting legislation and fiscal impacts.

Renewable Energy Resources

Legislation created a critically important grants and low-interest loan program that will make millions of dollars available for renewable energy projects through the South Carolina Department of Agriculture, which is working closely with the SCEO to implement the program. The Renewable Energy Infrastructure Development Fund provides small planning grants to assist in preparing major grant proposals and also offers matching grants for research and development and demonstration projects. The program will also include a low-interest revolving loan program designed to assist entities building renewable energy projects.

Other legislation provided significant new incentives for renewable energy production, distribution, and use. Some of the incentives will take place immediately, while others will be phased in over the next two years. Major elements include:



South Carolina's first plug-in hybrid-electric car and plug-in hybrid-electric bus.

Renewable Fuel Incentives for Production, Distribution, and Use:

- A production tax credit for ethanol and biodiesel: \$0.20 for ethanol and biodiesel produced from corn and soybeans; \$0.30 for ethanol and biodiesel produced from alternative feedstocks, such as switchgrass, wood, waste cooking oil, animal fats, and algae;
- Income tax credit of up to \$2,000 for plug-in hybrid vehicles purchases and tax rebates up to \$300 for the purchase or lease of vehicles that are flex-fuel (ethanol), hybrid, electric, or fuel-efficient with an EPA city fuel economy of 30 mpg or greater;
- Tax credits of up to \$100,000 for research and development of renewable fuel feedstocks best suited for South Carolina, such as cellulosic ethanol and algae-based biodiesel;
- Biofuels marketing program to promote public awareness;
- Five cents per gallon incentive payments available for retailers selling B20 biodiesel and E85 ethanol;
- Free ethanol and biodiesel testing for SC producers; and A requirement that all state-owned diesel pumps provide a minimum of five percent biodiesel.

Renewable Energy Production Incentives:

- Tax credits for the purchase and installation of equipment to produce electricity and gas from biomass resources including wood and wood waste, agricultural and animal waste, sewage, landfill gas, and other organic materials;
- Incentive payments for biomass energy users of \$0.01 per kilowatt-hour and \$0.09 per therm up to \$100,000;
- Tax credits for solar energy systems.

Renewable Energy Resources

Green Power: The SCEO has played a crucial role for many years in bringing public awareness and information to key stakeholders and South Carolina residents about the benefits of green power. As of FY07 state-owned Santee Cooper and the electric cooperatives were the only companies in the state offering green power to their customers. Over the past couple of years, the SCEO has partnered with the South Carolina Office of Regulatory Staff, investor-owned electric utilities in the state, and the non-profit North Carolina Green Power to explore opportunities for providing green power to customers in other areas of the state. In FY07, the state's major Investor-Owned Utilities (Duke, Progress Energy and SCANA) joined with the Office of Regulatory Staff and SCEO to create Palmetto Clean Energy, Inc. (PaCE), a green power program similar to that operating in North Carolina. If all goes as planned, customers will be able to begin purchasing green power in blocks of 100 kilowatt hours by early 2008. The effort will enable green power producers in South Carolina, including biomass energy producers and small solar photovoltaic systems, to sell power into South Carolina's electricity grid under attractive terms. The creation of PaCE represents a major achievement for the SCEO because most South Carolina residents will now be able to access green power and a majority will be able to sell green power into the grid at attractive prices.

Landfill Gas to Energy Projects: At the end of the 2007 legislative session, the South Carolina General Assembly expanded the provisions in Act 386 of 2006 for landfill gas tax incentives to include all forms of biomass energy. Act 83 of 2007 allows a facility to claim 25 percent of its biomass energy equipment costs against the business income tax.



The SCEO has partnered with the US Environmental Protection Agency's Landfill Methane Outreach Program (LMOP) since 1997 to evaluate, reclaim and use landfill gas for energy in the state. Strong efforts on Landfill Gas to Energy (LFGTE) projects have resulted in significant energy and environmental benefits for South Carolina.



Allied Waste/Santee Cooper
Lee County Landfill Gas Site

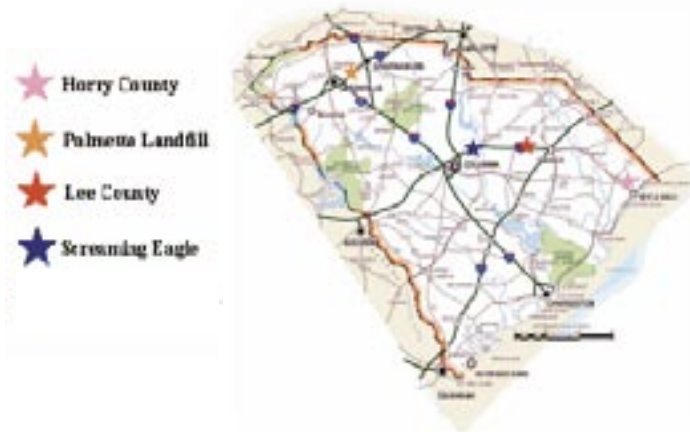
The largest LFGTE project to date, which involved major SCEO assistance, is Waste Management's Palmetto Landfill in Spartanburg County which produces the equivalent of 12 MW of power. The landfill gas produced at this site is sent to BMW's automotive manufacturing facility near Greer. The methane gas provides 63 percent of the plant's energy needs. BMW is the first automotive manufacturing plant in the country to utilize landfill gas for its paint shop and other portions of the plant. This project has saved BMW at least \$1 million a year and reduced emissions of greenhouse gases by about 60,000 tons annually.

Renewable Energy Resources

Santee Cooper's landfill gas projects include the following:

- Horry County Landfill generates 3.3 MW of power and is expected to increase to 9 MW.
- Allied Waste's Lee County Landfill generates 5.4 MW of electricity and is expected to increase to 21 MW.
- Screaming Eagle Landfill in Richland County generates 5.5 MW of green power and is expected to increase to 11 MW.

These facilities bring Santee Cooper's green power generation to a current total of 19.7 MW and a projected total of 54 MW. Three upcoming projects, including the Richland Northeast Landfill, Oak Ridge Landfill in Dorchester County, and the Hickory Hill Landfill in Jasper County, will bring the projected total to 71 MW by 2012.



Solar: In FY07, the SCEO helped to modified provisions for solar heating and cooling to define the incentive as anything that utilized solar energy including electrical and thermal applications. South Carolina continues to offer an income tax credit up to 25 percent of solar installation and equipment costs for homes or businesses, up to \$3,500.

Additionally, the SCEO extended a \$1,000 rebate offer to builders, home owners and re-modelers to incorporate solar water heating in certified green homes including EarthCraft, ENERGY STAR, LEED for Homes, and the National Association of Home Builders Green Home. The SCEO continued to maintain a list of solar dealers and installers and a solar inventory of all known solar applications in the state, which currently total about 160.

Solar energy is becoming increasingly popular in South Carolina due in part to the efforts of the SCEO and the South Carolina Solar Council, a creation of the SCEO. This past year, SCEO staff provided guidance to the SC Solar Council Board of Directors, helped develop an online presence through a new website, modifications to the strategic plan, and continued to provide support for non-profit 501 (C)(3) designation.

Renewable Energy Resources

Hydrogen: The SCEO worked with South Carolina organizations to make South Carolina a hub of hydrogen fuel cell research and development. Many research institutions, businesses, universities, and governmental entities around the state explored opportunities for hydrogen technology.

Some of these entities include the Savannah River National Laboratory in Aiken, which has been a major part of the US Department of Energy's hydrogen research for the past 20 years and is believed to contain the largest concentration of hydrogen researchers in the country. A recent

addition of the Center for Hydrogen Research near Aiken provided over 60,000 square feet of lab space for the Savannah River National Laboratory and private partners to investigate hydrogen disciplines. The National Science Foundation Center for Fuel Cells (the only one of its kind in the nation) at the University

of South Carolina in Columbia was established to help industry advance the technology and commercialization of fuel cells by performing pre-competitive research. Clemson University has incorporated hydrogen production and storage and automotive system integration into its International Center for Automotive Research (CU-ICAR).

The South Carolina Hydrogen and Fuel Cell Alliance represents the statewide interests of South Carolina universities and the National Laboratory. FuelCellSouth, based in Columbia, brings together fuel cell researchers, entrepreneurs, and existing businesses in an environment ready for the emerging hydrogen economy.



The Greater Columbia Fuel Cell Challenge was launched with the help of funding from the South Carolina Research Authority to create a plan to make the region a center for fuel cell use. EngenuitySC is a strategic leadership council designed to coordinate initiatives in Columbia for technologies such as hydrogen fuel cells and to work closely with the Fuel Cell Challenge. The SCEO continues to work with the Greater Columbia Fuel Cell Challenge, EngenuitySC, and FuelCellSouth on collaborative efforts. The SCEO is also a partner with the South Carolina Hydrogen Fuel Cell Alliance in preparations to host the National Hydrogen Association's 20th Annual Hydrogen Conference in 2009 at the Columbia Metropolitan Convention Center.

In association with the national conference, a hydrogen fuel cell-powered bus will come to Columbia for a year. The SCEO is working with the University of South Carolina and other entities to establish a fueling station for the bus and other fuel cell powered vehicles in the Columbia area.



A series of tax incentives and a grant program was passed in Act 83 of 2007 specifically for hydrogen development. Unfortunately, the hydrogen grant program was eliminated in 2007 due to unexpected budgetary shortfalls.

Facilities

The South Carolina Energy Office (SCEO) promotes energy efficiency in government agencies and public schools by encouraging the adoption of programs and procedures designed to capture and measure energy use, analyze key energy data for the development and implementation of energy saving measures, and incorporate these improvements into a master energy plan. In addition, the SCEO provides energy audits or assessments, special grants, or low interest loans to encourage installation of energy efficient equipment or systems improvements in public facilities.

Green Building

The SCEO recognizes that buildings are responsible for a majority of energy used in the state, and that high performance buildings will reduce energy consumption. Accordingly, we support green building initiatives ranging from Leadership in Energy and Environmental Design (LEED) certification developed and promoted by the US Green Building Council (USGBC) to the EarthCraft House program developed by Southface to the National Association of Homebuilders program supported locally by the Greater Columbia Association of Homebuilders.

Leadership in Energy and Environmental Design (LEED) Building Program: LEED is a nationally accepted benchmark for the design, construction and operation of high performance “green” buildings. The SCEO has played an important part in promoting LEED throughout the state, and continues to maintain a USGBC membership on behalf of the State, allowing any state employee to enjoy



membership privileges through the SCEO corporate membership. The SCEO was also instrumental in the formation of the South Carolina Chapter of the US Green Building Council.

SCEO staff members have served on the Board of the state chapter since its inception. Currently SCEO serves as the recorder of continuing education credits obtained through USGBC-SC events, and a SCEO staff member co-chairs the program committee.

In 2007, SCEO worked with the USGBC and the General Assembly on development of a bill requiring LEED or the equivalent certification for most state construction and renovation. SCEO will work with the State Engineer’s Office to implement the bill as passed. SCEO also worked on bills to require LEED certification for schools, and to offer tax credits for LEED-certified private construction. These bills are pending before the General Assembly.

By the end of FY 2007, 70 projects in the state had been registered with the USGBC, indicating their owners’ intention to seek LEED certification. This represents almost a three-fold increase in registered projects since last year. Of the 70 registered projects, 14 have already achieved certification. One of the certified buildings is a public school, three are owned by public universities, one by a private university, one by a state agency, six by private for-profit owners, and two by a not-for-profit entity. South Carolina now boasts approximately 300 LEED-accredited professionals.

Facilities



EarthCraft Houses: The SCEO continued its partnerships with the Home Builders Association of Greenville, Charleston Trident Home Builders Association, and Southface Energy Institute to pilot the EarthCraft House program for the Greenville and Charleston areas. In FY07 the partnership built 102 EarthCraft Houses and trained over 100 builders and other building industry professionals.

Three leading builders in the Lowcountry have made a commitment to build 80 percent of their homes to EarthCraft House standards, and a leading Upstate builder has committed to building 100 percent of his houses to EarthCraft standards. Four EarthCraft builder training workshops were conducted this year, two of which were in Charleston. SCEO also sponsored workshops in Greenville and Bluffton. The success of the EarthCraft House program in Charleston and Greenville has led to participation by developers and builders in Hilton Head, Bluffton, and other parts of the state. There are now two certified EarthCraft inspectors in the Charleston area, which will facilitate speedy certification of homes in that area.

Energy Star Homes: The US Environmental Protection Agency (EPA) extended its well-known Energy Star program to homes in order to help homeowners find energy-efficient homes. According to the EPA, Energy Star qualified homes use substantially less energy than conventionally constructed homes for heating, cooling, and water heating, thus delivering \$200 to \$400 in annual savings for each home. The SCEO promotes all Energy Star programs.

ConserFund: In FY07 Florence County School District was issued a \$450,000 energy conservation loan financing an energy project to improve the school learning environment through better lighting and more comfortable and more efficient heating and cooling. The project will generate over \$31,113 annually in energy savings. The ConserFund loan program for public and non-profit entities has 31 loans in its portfolio, and a total energy savings over \$33 million is expected for the life of these projects.

SCEO has assisted in financing an array of energy conservation measures such as: implementation or upgrade of energy management and control systems; modification or installation of heating ventilation and air conditioning systems; lighting retrofits; light switch reconfigurations; replacement and installation of chillers; installation of air handlers and heat reclaim units; and other energy cost-savings improvements. As loans are repaid, the funds are recycled through a revolving loan fund and continue to finance new energy savings opportunities for taxpayer-supported facilities.

ConserFund Loans 99-07

Charleston Area Regional Transit Authority
Charles Lea Center, Spartanburg
Cherokee County School District (2)
Clemson University
Darlington County School District (2)
Florence County School District Three
Greenville County
Lexington School District Two
Office of the Adjutant General
Pickens County School District
Piedmont Technical College
SC Department of Corrections
SC Division of General Services (4)
SC School for the Deaf and Blind (4)
Town of Ware Shoals

Facilities

Energy Accounting Software: The SCEO and SchoolDude.com continued their partnership in FY 2007, working to provide a Web-based energy accounting system to public entities in South Carolina. Through SCEO's and SchoolDude's efforts, South Carolina is one of only a few states in the nation with a statewide, Web-based energy accounting system. This system, called Utility Direct, allows public entities to log and track their energy costs and usage via a Web-based platform. By utilizing this system, public facility managers are able to more closely monitor and analyze their utility expenditures in order to identify problems and savings opportunities. In FY 2007, 60 of 155 public entities subscribed to Utility Direct from SchoolDude.com as a means of logging and tracking their energy expenditures. SCEO supports their efforts through individual assistance, regional seminars and online demonstrations.

Success Story: Georgetown School District

In the past three years, Georgetown School District has made improvements that reduced energy consumption by over 1 million kBtu's from 2004/05 to 2005/06 and that are projected to produce further reductions in 2006/07. The Energy Management Department upgraded the District's energy management system, replaced HVAC units, implemented "no cost" measures, and started tracking all utility bills. A three-year usage comparison chart illustrates the results.

The major capital improvement was the replacement of 91 rooftop HVAC units on 5 of the District's 17 schools. The new 14 SEER units use 410A refrigerant (which is non-ozone depleting) and variable speed indoor fan motors. In a side-by-side actual runtime comparison with the older 7 SEER units, the new units reduced usage up to 30 percent.

Several in-house projects, implemented at no cost other than staff time, generated savings of \$93,000 in 2005-06. These included removing lights from vending machines and changing the nighttime temperature setbacks. The District also restructured utility rates and identified billing errors.

Georgetown School District's Energy Manager, Tony Holcomb, has a three-pronged approach to energy management—technology, tracking, and education. He offered the following snapshots of the Energy Management Department's ongoing program.

The Energy Management System

We use Automated Logic's WebCTRL for monitoring and setting our HVAC, load control devices, water heaters, exhaust fans and some lighting. We have been using ALC and Harris Integrated Solutions since 1995 and the Energy Management Service saves us hundreds of thousands of dollars each year. Since we have gone to a Web based program now we can have access to the Energy Management Service with any internet connection available.

Energy Monitoring and Recording

We use School Dude's Utility Direct to monitor and analyze all of our utilities. We can now more precisely compare school to school, month to month and even year to year usage, check for billing errors, and compose comprehensive reports and more accurately report usage to the State Energy Office. We can even identify areas where savings are possible by investigating bills that vary in usage and cost above a certain amount to see if there is a water leak, equipment operating after hours, etc.

Facilities

The Monthly Energy Report

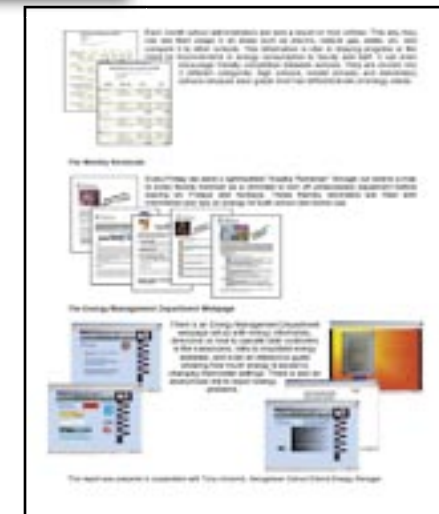
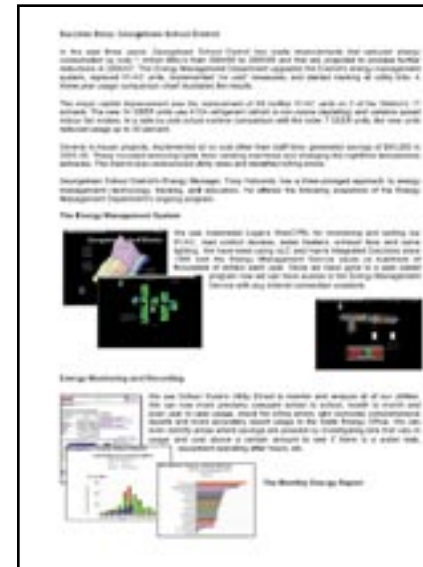
Each month school administrators are sent a report on their utilities. This way they can see their usage in all areas such as electric, natural gas, water, etc. and compare it to other schools. This information is vital in relaying progress or the need for improvements in energy consumption to faculty and staff. It can even encourage friendly competition between schools. They are divided into 3 different categories: high schools, middle schools, and elementary schools because each grade level has different levels of energy needs.

The Weekly Reminder

Every Friday we send a lighthearted “Weekly Reminder” through our district e-mail to every faculty member as a reminder to turn off unnecessary equipment before leaving on Fridays and holidays. These friendly reminders are filled with information and tips on energy for both school and home use.

The Energy Management Department Webpage

There is an Energy Management Department webpage set up with energy information, directions on how to operate slide controllers in the classrooms, links to important energy websites, and even an interactive guide showing how much energy is saved by changing thermostat settings. There is also an anonymous link to report energy problems.



Facilities

Higher Education Rewards Program: The Rewards for Higher Education Energy Efficiency Projects (RHEEEP) program concluded in 2007. RHEEP was in effect seven years and disbursed \$160,591 in awards for 13 projects. Projects in higher education not only conserve energy and save money, but often serve as examples of best practices to students on campus.

2000-2007 RHEEEP Grants Implemented

Citadel (3)
Lander University
MUSC (3)
Piedmont Technical College (2)
Trident Technical College
USC-Columbia
USC-Upstate
USC-Beaufort

Technical Workshops: The SCEO provides technical information at a number of workshops and conferences throughout the year. In addition, the agency sponsors several technical workshops in conjunction with the Boiler Efficiency Institute. Over the 15 years of this partnership, hundreds of South Carolina engineers and other technical personnel have participated in low-cost workshops. The Boiler Efficiency Institute course fee is normally \$600+ but with SCEO sponsorship the cost for SC attendees is only \$150. These workshops highlight plant operation

energy efficiency improvements that reduce emissions and save energy dollars, and also provide engineering Professional Development Hours and C.E.U. credits. Two boiler workshops were offered in FY 2007, attended by a total of 68 engineers and facility managers from a range of public and private entities around the state. The SCEO and the Boiler Efficiency Institute also offered a course called Engineering Fundamentals in Everyday Language, designed to acquaint non-engineers, as well as engineers and managers, with the best way to improve efficiency, reliability and function of energy systems. Thirty-six engineers and others improved their skills at this workshop.



CEM Training: For the third consecutive year, the Association of South Carolina Energy Managers and the SCEO partnered to offer a classroom training program to prepare qualified energy managers for the Certified Energy Manager (CEM®) certification examination. The Association of Energy Engineers (AEE) certifies this nationally recognized credential, designed to identify the most qualified and trained energy managers in the country. The Certified Energy Manager (CEM®) credential is widely accepted and used as a measure of professional accomplishment within the energy management field.



Facilities

It is recognized by the US Department of Energy and the Office of Federal Energy Management Programs (FEMP), as well as numerous state energy offices, major utilities, corporations and energy service companies.

SCEO underwrites the cost of the training and provides it locally, so South Carolina participants do not have to pay for travel, food and lodging in Atlanta. Participants only pay for books, travel expenses to Columbia, and the exam application fee, and not the \$1500 fee charged by other providers. We do this because we believe that CEM training is a very valuable asset to anyone charged with managing energy generation or use, and that CEM training ultimately will make organizations more energy efficient. To date, 42 energy managers have been trained.

Energy Audits: The SCEO conducted Level II energy efficiency audits at Camp Long in Aiken County, J. Floyd Manor in Charleston, Caesars Head and Jones Gap State Parks in Greenville County. SCEO staff identified potential savings of \$144,000 over the lifetime of the recommended upgrades and improvements. Level II energy audits are walk-through energy assessments of building energy costs and efficiency which identify recommendations for savings, cost analysis, and any operation and maintenance needs. Since 2001, the SCEO has coordinated more than 79 audits, identifying \$32.7 million in potential savings.

Industries of the Future (IOF): In recent years the SCEO received and implemented three Special Projects Grants from the US Department of Energy (USDOE) to promote energy efficiency in South Carolina industry through the Federal Industries of the Future program.

The first grant targeted South Carolina's metalcasting industry, a very high energy user. This grant was successfully completed through a partnership with the South Carolina Manufacturing Extension Partnership (SCMEP), which performed detailed energy assessments of 34 metalcasters in South Carolina. The USDOE awarded \$178,425 and SCMEP contributed \$45,000 to fund the \$223,425 project. Production and process changes resulting from these energy assessments are expected to generate almost \$3 million in annual energy savings.

The second grant was completed last December and helped South Carolina industries incorporate best practices as defined and developed by USDOE. The USDOE awarded \$100,000 and SCMEP contributed \$45,000 to fund the \$145,000 project. SCMEP developed a Website (www.EnergySC.org) for South Carolina industry and provided energy assessment information and comparative review information to identify successful energy use practices. A statewide SCMEP Energy Symposium was held in Columbia in October 2006 and was highly successful event with over 100 attendees. The results of the work completed under the grant are expected to generate annual savings of approximately \$7.9 million.

The final award, a \$91,000 USDOE Special Project Grant, was provided to the SCEO in partnership with SCMEP to implement energy efficiency initiatives for South Carolina's largest industrial energy users. SCMEP contributed an additional \$64,400 for the grant to generate \$155,600 for the program. Fourteen of the state's large energy users will be identified for application of USDOE tools, best practices, and other resources to create large energy use improvements. Additionally, the project will emphasize recycling and reuse of production by-products.

The grant project intends to reduce energy consumption, limit impact on

Facilities

production output and develop energy efficient strategies which could be replicated industry-wide. Tools to accomplish these goals include energy assessments, comparative reviews, specialized technical assistance, and instruction on best practices for large-scale industrial energy efficiency. The grant is scheduled to run through September 2008. To date, work has been initiated or completed with thirteen industrial clients. As an additional requirement under the grant, SCMEP has one representative that became certified in the Process Heating Assessment and Survey Tool (PHAST), a software application that will enable them to assist clients in increasing thermal efficiency of thermal equipment. The financial impact of work completed is anticipated to be substantial.

The Industries of the Future (IOF) program and the SCEO/SCMEP partnership intends to help South Carolina businesses remain competitive both nationally and internationally through greater energy efficiency.

Manufactured Housing Energy Efficiency: Because of federal preemption, state and local governments are not allowed to impose residential energy code standards on manufactured housing. South Carolina has one of the highest percentages of new manufactured homes in the nation, and energy efficiency in these homes is critically important if the state is ever to achieve significant energy efficiency in the residential sector. To encourage energy efficiency without mandating energy standards, the General Assembly enacted legislation in the early 1990s to establish energy efficient standards for mobile homes and cap sales taxes at \$300 for those homes meeting the standard.

In 1996 the SCEO assumed responsibility for the distribution of energy efficiency labels for qualifying manufactured homes sold in South Carolina. These homes are expected to save, on average, \$258 per

year for a doublewide model and approximately \$152 for singlewide model over the lifetime of the home. In FY07, the SCEO distributed approximately 1,500 labels. More than 48,000 energy efficiency labels have been distributed since 1998, with the higher energy efficiency standards saving manufactured home owners over \$10 million annually compared to non-energy efficient homes. The SCEO maintains a database of all energy efficient manufactured housing labels issued, and offers additional energy-saving advice to interested home owners.

Performance Contracting Projects: The SCEO was successful in obtaining two successful US Department of Energy Special Project Grants for performance contracting.

The first grant award to the SCEO was \$46,425 to develop a report for public colleges and universities about the advantages and disadvantages of performance contracting. The project developed five case studies on public institutions of higher education in the southeast region that have undertaken performance contracting energy efficiency activities, including The Citadel, University of South Carolina, and Winthrop University. East Tennessee State and Florida State universities also participated in the studies.

These case studies focused on key elements of the performance contracting process including: the preliminary planning phase; procurement and contract negotiation; project implementation; and monitoring and verification. A summary of the case studies that identified best practices, common problem areas, and lessons learned was presented at the Association of South Carolina Energy Managers (ASCEM) Spring Conference in March. These studies are being presented throughout the state and nationally.

Facilities

The second USDOE grant provided \$98,000 for a partnership with the National Association of Energy Service Companies (NAESCO) to help public buildings reduce energy consumption in two steps: (1) through a NAESCO analysis of successful public building programs; and (2) through a NAESCO certification for state energy office staff from throughout the nation.



On April 11-12, 2007, the SCEO and the National Association of Energy Service Companies (NAESCO) hosted a training workshop in Columbia.

The workshop program consisted of a comprehensive introduction to the elements of energy performance contracting (EPC) and the design and implementation of a statewide EPC program for state EPC program managers and facility managers. The workshop was presented by a team of experienced Energy Service Company (ESCO) industry consultants, with assistance from several state energy office officials and a senior executive from a project financing company.

The workshop was attended by 49 people, representing 11 companies (Ameresco, Custom Energy, Siemens, Johnson Controls, Honeywell, Pepco Energy Services, TAC and Trane, WESCO, Control Management and R.J. Griffin), 9 state government agencies responsible for energy efficiency programs (South Carolina, North Carolina, Kansas, New York, Pennsylvania, Louisiana, Georgia and Alabama), and several major end use customers, such as school districts, colleges and prisons. Continuing Education Credits were issued to applicable attendees. Evaluations gave the instructors and the course high marks, ranging from 3.52 to 3.83 out of 4.00.

Utility Bill Analysis Program: The SCEO, working with the South Carolina Materials Management Office, established a statewide term contract that made utility bill analysis services readily available to state and local government units in South Carolina. Eight vendors met the contract solicitation criteria and have been placed on a Qualified Provider List (QPL) to provide analysis of energy and telecommunications bills.

Utility bill analysis is the systematic and thorough review of an organization's utility bills to find billing errors or misapplied rates and to obtain refunds of overcharges from the utility providers. The utility bill analyst also examines the organization's usage patterns and current utility rates to determine if alternative rates are available that would lower the organization's utility costs. The utility bill analyst assists the organization in negotiating with the utility provider to make account changes favorable to the organization.

A governmental unit may contract with any of the qualified vendors for energy utility bill analysis or telecommunications bill analysis or both types of analysis. There are no upfront fees; the contractor is compensated from utility bill refunds and cost savings. The state term contract information may be accessed at: <http://www.state.sc.us/mmo/solaward.htm> for review or download.

Transportation

The transportation sector accounts for 25 percent of all energy used in South Carolina, 39 percent of energy expenditures, and 44 percent of the state's air pollution (53 percent of nitrous oxides, 24 percent of volatile organic compounds, 32 percent of carbon dioxide, and 70 percent of carbon monoxide). Use of alternative fuels not only improves air quality, but also improves security against supply disruptions and develops markets for domestically produced fuels.

Palmetto State Clean Fuels Coalition: The Palmetto State Clean Fuels Coalition (PSCFC) is a SCEO-sponsored group of public and private stakeholders. The PSCFC and its stakeholders continue to improve access to alternative fuels for the public by installing alternative fuels infrastructure and educating public and private sector fleet managers, the general public, fueling station owners, and government entities. In FY07, in cooperation with the SCEO, the PSCFC was awarded with a \$10,000 from the National Biodiesel Board Foundation to host the SC Biodiesel Fuel Quality Symposium to educate state biodiesel fuel producers about the importance of fuel quality. The PSCFC also played a major role in FY07 with its involvement with the Strategic and Tactical Research on Energy Independence Commission and the SC Biomass Council to establish landmark state incentives for alternative fuel production, distribution, and consumer use.

Alternative Fuel State Tax Incentives: In FY07, significant state incentives were passed for alternative fuel production, distribution, and use as well as establishing attractive vehicle incentives. These renewable fuel incentives for production, distribution, and use include:

- A production tax credit for ethanol and biodiesel. \$0.20 for ethanol and biodiesel produced from corn and soybeans.
\$0.30 for ethanol and biodiesel produced from alternative

feedstocks, such as switchgrass, wood, waste cooking oil, animal fats, and algae;

- Income tax credit of up to \$2,000 for plug-in hybrid vehicles purchases and tax rebates up to \$300 for the purchase or lease of vehicles that are flex-fuel (ethanol), hybrid, electric, or fuel-efficient with an EPA city fuel economy of 30 mpg or greater;
- Tax credits of up to \$100,000 for research and development of renewable fuel feedstocks best suited for South Carolina, such as cellulosic ethanol and algae-based biodiesel;
- Biofuels marketing program to promote public awareness;
- Five cents per gallon incentive payments available for retailers selling B20 biodiesel and E85 ethanol;
- Free ethanol and biodiesel testing for SC producers; and
- A requirement that all state-owned diesel pumps provide a minimum of five percent biodiesel.

Alternative Fuel Refueling Infrastructure:

A major goal of the SCEO is to promote public accessibility to alternative fuels such as E85 and biodiesel by increasing fuel infrastructure. In FY07, South Carolina had 42 publicly accessible E85 refueling stations, making it a national leader in public availability. In FY07, 42 South Carolina stations sold biodiesel (commonly blended into B20). In FY07, South Carolina had 42 publicly accessible E85 refueling stations, making it a national leader in public availability. There were also 42 South Carolina stations selling biodiesel (commonly blended into B20.)

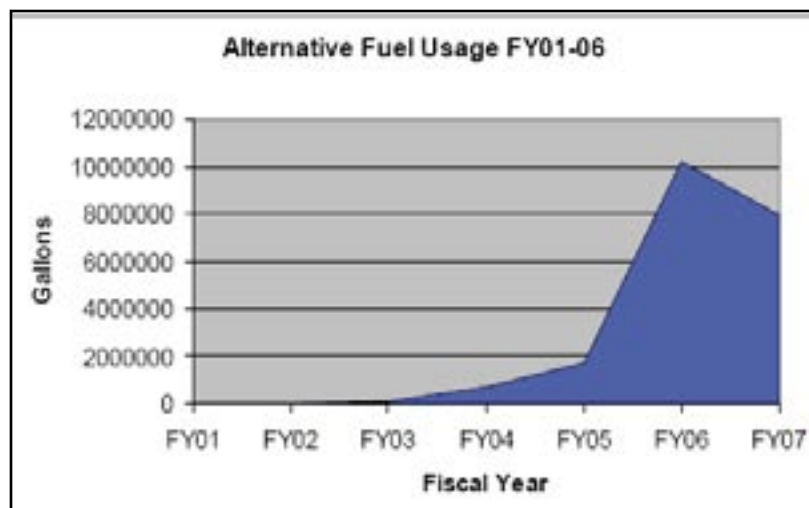
Transportation

The SCEO continued work on previously-awarded DOE Special Projects grants, including: (1) the installation of an above-ground, 3,000-gallon ethanol storage tank at the University of South Carolina; (2) the retrofit of four 65,000 gallon tanks at United Energy's bulk storage facility in Aiken to store and dispense ethanol and biodiesel; and (3) the conversion of 11 South Carolina Schwann's home delivery service trucks to use propane. All three of the awards were completed during FY07. In FY06 the SCEO received a \$25,000 federal grant to establish a government fleet ethanol fueling station in Rock Hill, in order to support the use of E85 by the City of Rock Hill, York County Natural Gas, the City of Clover, Palmetto State Clean Fuels Coalition and York Technical College. This installation was completed at the end of FY07.

In FY07, approximately 8 million gallons of alternative fuel were used throughout South Carolina. Of that amount, 6,300,000 gallons were ethanol, 1,600,000 were biodiesel and 33,000 were compressed natural

gas. Alternative fuel use declined by 2 million gallons from FY06 which can be attributed to a spike in ethanol prices due to unexpected world-wide demand. It is anticipated that ethanol prices will become more competitive as supply increases from expanded corn production nationwide.

Biodiesel Production: The SCEO has played a significant role in attracting alternative fuel businesses to South Carolina. In FY07 two companies produced biodiesel and three companies announced intentions to build or have started construction of new facilities. A biodiesel facility in Taylors, Carolina Biofuels, produced 5.6 million gallons of biodiesel in FY07 and will eventually produce 30 million gallons annually. The facility is using soy oil as a feedstock. Southeast Biodiesel built a biodiesel production facility that is using chicken fat as its primary feedstock. The facility is located in North Charleston at the former Charleston Naval Base. The facility produced 100,000 gallons of fuel during its start-up phase in FY07 and expects to produce 6 million gallons in FY08. Three additional companies announced plans to build biodiesel facilities, including Ecogy Biofuels in Estill, Farmers and Truckers Biodiesel in Aiken, and Greenlight Biofuels in Laurens.



Transportation

Alternative Fuel Vehicles:

In FY07, the SCEO coordinated with State Fleet Management the South Carolina Department of Agriculture and General Motors (GM) to purchase an E85-capable Chevy Avalanche. SCEO drove the vehicle about 10,000 miles using E85 fuel. This prevented approximately 20,000 pounds of carbon dioxide and 575 pounds of nitrous oxide from entering the atmosphere.



diesel engines consume a gallon of fuel per hour of idling. In FY07, 57 parking spaces at the ATE location in Spartanburg displaced 139,495 gallons of diesel fuel or an average of 11,624 gallons per month while reducing annual carbon dioxide emissions by 1,450 metric tons. The total annual savings for all three ATE locations funded by this grant is 321,834 gallons, or an average monthly rate of 26,820 gallons saved.

Truck Stop Electrification: The SCEO previously obtained a \$1.5 million competitive federal grant, to help install Advance Travel Center Electrification (ATE) stations at three truck stop locations along I-85 in South Carolina, Georgia, and North Carolina.

Long-haul truckers traditionally idle their engines during required rest periods to provide heating or air conditioning to the cab and to power auxiliary systems. The ATE solution is focused on the inherent problem that an idling diesel engine is a terribly inefficient source of energy for heating and cooling a truck cab. In winter as well as summer, 85 percent - 95 percent of the energy expended during diesel idling is wasted as heat and unburned pollutant gases. The IdleAire system provides immediate, measurable, long-term air quality improvements, removing 100 percent of emissions associated with extended diesel idling. On average, truck



Public Information and Service

Distributing information is an integral part of achieving awareness and education in a community. The SCEO reaches a variety of audiences in the state through its Website, newsletter, marketing materials, K-12 education program, and information distributed through the news media and participation at community events.

SCEO Website: Since its inception in 1997, the SCEO Website has provided information to visitors about SCEO programs and a wide range of energy information. In FY07 the website received approximately 850,000 hits and 34,000 unique visitors. The Website received a new look in January 2007. Information is now more easily accessible and more timely. The Website also meets state disability requirements for hearing and visually-impaired visitors. To access the SCEO Website, go to www.energy.sc.gov.



Energy Data: SCEO used its comprehensive energy model to conduct energy forecasts and comprehensive assessments of the opportunities and constraints for various types of energy production and usage within South Carolina. In FY07, SCEO provided historical and forecast data for use by the Governor's Climate, Energy, and Commerce Advisory Committee.

Demand-Side Management: SCEO routinely surveys utilities to determine what, if any, demand-side measures they support in order to encourage energy conservation and efficiency. SCEO's 2006 Demand Side Management and System Overview report, including information about energy supply, use and distribution, is available in the public information section of the SCEO Website.

Utility Price Data Survey: All electricity providers in the state were surveyed for industrial, commercial, and residential utility prices. Information was compiled and placed on the Website for consumers to compare utility costs and other data pertaining to the state's 45 electricity retailers. The SCEO's Website contains the only comprehensive listing of South Carolina electric utility prices.

Public Information and Service

Other Public Information Activities:

In FY07 the SCEO did the following:

- Answered nearly 400 information requests from the public.
- Distributed approximately 10,000 energy-related handouts and publications to citizens throughout the state.
- Educated over 3,700 individuals through 43 presentations and other community activities, all focusing on energy in South Carolina, as well as various programs and services offered by the SCEO.
- Published summer and winter editions of the SCEO newsletter, *The Energy Connection*. In addition to being posted online, each edition was sent electronically and via mail to 1,000 subscribers.
- Exhibited at the Home and Outdoor Living Show in North Charleston and the Columbia Classic Home and Garden Show to educate homeowners and building professionals about energy efficient construction, sustainable living practices, and tax incentives available for energy efficiency measures. Altogether, the SCEO distributed nearly 1,800 handouts and publications at these two events.
- Participated in five Earth Day events in various areas of the state, where citizens, families, and students learned about the environmental and economical benefits of energy conservation.



Energy Education: The SCEO facilitated the training of 201 teachers in the K-12 Energy 2 Learn program from the Action for a Cleaner Tomorrow curriculum. The teachers represented 33 school districts. A total of 4,663 6th grade students enjoyed an hour-long, hands-on energy presentation in their classrooms. Students increased their knowledge of energy an average of 50 percent based on the differences between pre-test and post-test scores.



In addition, the SCEO participated in the “Take Action Today” teacher workshop, a free, full-day event sponsored by the South Carolina

Department of Health and Environmental Control, in which 100 teachers were introduced to the *Energy 2 Learn* program.



Public Information and Service

SC Envirothon Competition: The SCEO played a key role in the 11th Annual SC Envirothon Competition, a day-long integrated education experience that promotes education among high school students so they will be environmentally literate and possess the skills and knowledge to make informed decisions regarding the world around them. SCEO representatives served on the Envirothon steering committee and sponsored this year's current environmental topic station focused on alternative energy. This involvement included the creation of learning objectives, oral presentation scenario, written test, and grading system prior to the event, and test administration, test grading, and award presentation on the day of the event. Twenty-six teams of six students each traveled to Columbia from around the state to participate.

Drive Smart Cards: In 2007 SCEO developed wallet-sized cards designed to remind drivers of flex-fuel options and let them know how to determine if their vehicles can accept E-85. The cards also include tips to reduce fuel consumption. Intended for young drivers, the cards are distributed through presentations in high school driver education classes conducted under the auspices of DHEC.

Service: Members of the SCEO staff serve on various boards and committees, including the Governor's Climate, Energy, and Commerce Advisory Committee. SCEO Director, John Clark, serves on the Advisory Committee, while four other staff members serve on Technical Working Groups to provide energy expertise. Additionally, SCEO staff serves on the City of Columbia's Climate Action Protection Committee, the South Carolina Solar Council, the South Carolina Chapter of the US Green Building Council, the South Carolina Environmental Excellence Advisory Committee, the South Carolina Biomass Council, the Palmetto State Clean Fuels Coalition, the Association of South Carolina Energy

Managers, the Atlantic Interstate Low-Level Radioactive Waste Management Compact, the Governor's Nuclear Advisory Committee, the South Carolina Rural Development Council, the South Carolina Hydrogen and Fuel Cell Alliance, the USC Columbia Fuel Cell Collaborative, and the South Carolina Energy.



Radioactive Waste Disposal Program

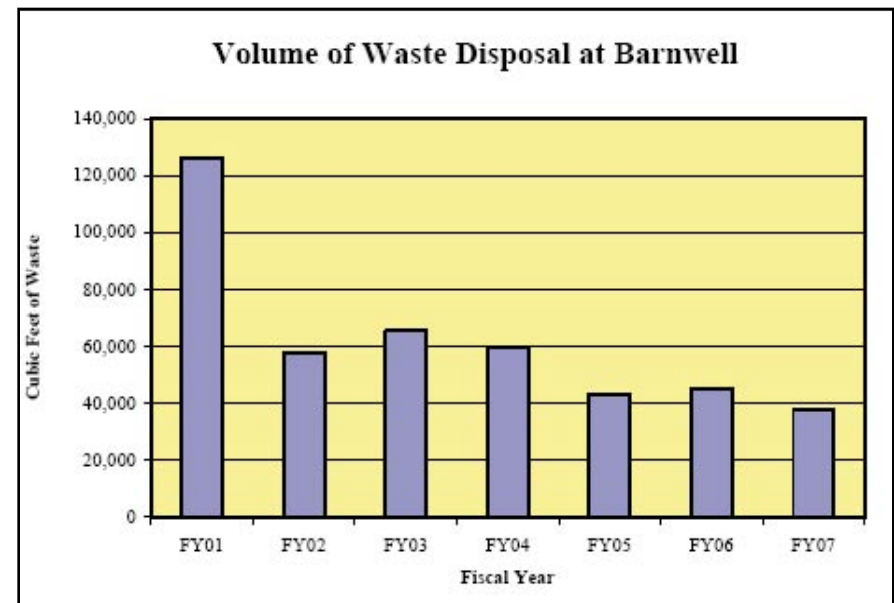
The SCEO is charged with management and oversight of the Budget and Control Board's low-level radioactive waste disposal facility in Barnwell County. As the disposal site transitions from a national depository to a facility open only to members of the Atlantic Compact, the SCEO remains committed to reducing waste volume while maximizing disposal revenues.

Volume Reduction: SCEO's Radioactive Waste Disposal Program (RWDP) continued to reduce the volume of radioactive waste accepted at the Barnwell site in accordance with state law, while maximizing the dollars received for each shipment.

The volume of waste received at Barnwell each year has declined dramatically since the 1980s. The chart illustrates how the total amount of waste received at the disposal site has continued to decline since the passage of a new state law in 2000. After July 1, 2008, the disposal site will accept waste only from South Carolina, Connecticut, and New Jersey, which make up the Atlantic Compact.

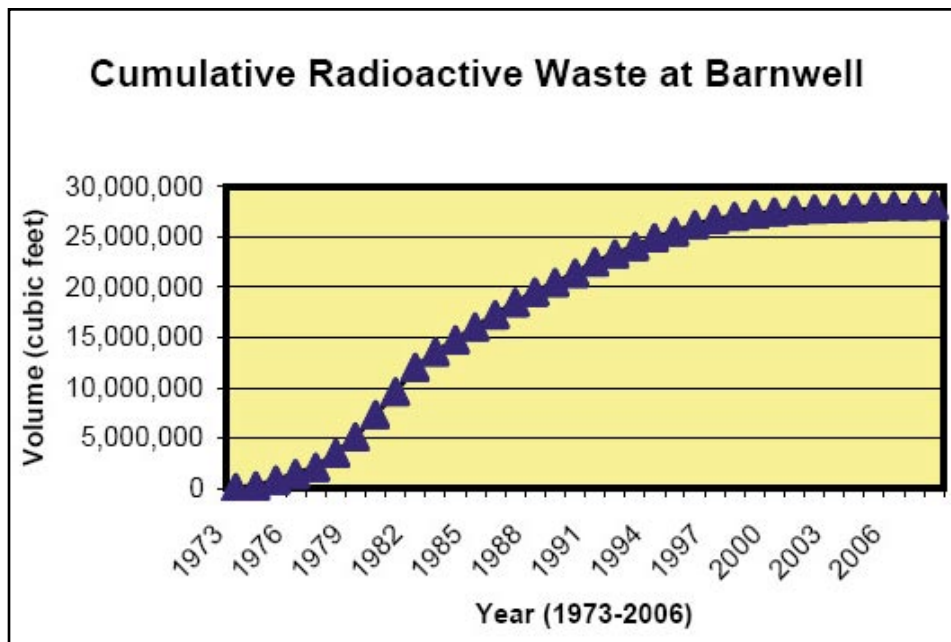
Money received for radioactive waste disposal at the state-owned Barnwell facility is earmarked for higher education scholarships, school construction, Barnwell County needs, and for rebates to South Carolina companies that use the disposal site. Disposal revenues are highly dependent on an evolving waste processing and disposal market. RWDP staff recommends disposal rate schedules designed to achieve the highest revenues possible. In some cases, staff negotiates disposal rates directly with customers.

In FY07, state law allowed the acceptance of 40,000 cubic feet of waste at the Barnwell site, and 37,667 cubic feet of waste were received. As volumes have decreased, the SCEO has been successful in achieving higher revenues per cubic foot of space used, thus mitigating the financial effect of lower disposal volumes. Per-cubic-foot dollars billed to customers for disposal of waste at Barnwell have increased from an average of \$522 in FY01 to \$998 in FY07.



Radioactive Waste Disposal Program

The Barnwell site received \$35.5 million in disposal payments from customers and interest in FY07. Of this amount, approximately \$15.8 million was required for facility operating costs and other obligations. Of the remaining \$19.7 million, \$2 million was transferred to Barnwell County government, \$600,000 was rebated to South Carolina businesses that use the Barnwell site, and \$17.1 million was earmarked for the higher education scholarship fund and the public school building fund.



Planning for Regional Operations: Beginning July 2008, the Barnwell site will be limited to waste generators in the three Atlantic Compact states. This will reduce the amount of income received by the disposal site significantly. State law requires that the Budget and Control Board direct the disposal site operator to make plans to avoid operating deficits

by changing the way the site is operated so as to reduce operating costs. In April 2007, the B&CB notified the disposal site operator to begin planning for post-2008 operations. Options include reducing the work force at the facility, part-time operations, and closing large portions of the facility where permanent site caps have been constructed.

Planning for Care of the Site after Closure. Once the Barnwell site closes, the State of South Carolina will be responsible for Barnwell's ongoing monitoring and maintenance. Federal and State regulations require that plans be in place for overseeing the disposal grounds for at least 100 years after it closes. The RWDP oversees a special account where fees are deposited to cover these future costs. A consultant's report prepared for the RWDP in FY02 estimated that the State would need a balance of \$90.5 million as of July 1, 2007, in order to generate enough interest to cover all of the State's costs for taking care of the Barnwell site after it closes. At the end of FY07, the Barnwell Extended Care Fund had approximately \$120 million. The B&CB began developing plans to update and improve long-term cost projections for maintaining the disposal site.

Supporting Barnwell County Economic Development: The Radioactive Waste Disposal Program worked with Barnwell County Council to prepare recommendations to the Budget and Control Board for disbursements from the Barnwell Economic Development Fund. The fund was established with an initial deposit of \$12 million from Connecticut and New Jersey as an incentive for South Carolina's membership in the Atlantic Compact. During the fiscal year, the Board approved disbursements of \$140,000 toward development of a new library, airport terminal, and law enforcement center in Barnwell County.

Radioactive Waste Disposal Program

Calculating Rebates for South Carolina Customers: For the seventh year, the RWDP worked closely with the Office of State Treasurer to calculate disposal rebates due to South Carolina customers of the Barnwell site. State law directs that South Carolina generators be eligible to receive rebates of 33.3 percent of any disposal fees paid, exclusive of certain taxes and surcharges included in the disposal fees.

For FY07, eleven South Carolina generators requested disposal rebates totaling \$550,000. The RWDP notified all generators regarding the availability of rebates, collected the rebate requests, deducted the excluded taxes and fees from the disposal fees, and provided a report to the Office of State Treasurer for issuance of the rebate funds.

Supporting the Atlantic Compact Commission and the Governor's Nuclear Advisory Council: The RWDP provided technical support to South Carolina's Commissioners on the Atlantic Compact Commission and maintained close communications with the Compact staff. The RWDP also provided staff support for the Governor's Nuclear Advisory Council, which met three times in FY07. The Atlantic Compact Commission also has a Website with up-to-date information. The Website is maintained in part by SCEO staff. The Website may be found at www.atlanticcompact.org.

Funding and Administration

The South Carolina Energy Office, a unit of the State Budget and Control Board, has a staff of 15 and a budget of \$2.6 million. Unlike most state organizations, the SCEO receives no state appropriations. Funding is derived from a number of sources including the USDOE State Energy Plan grant (\$486,000 in FY 2007), federal petroleum violation trust funds, and fees from radioactive waste surcharges at the state-owned disposal facility near Barnwell. The SCEO also manages an \$8 million revolving loan fund. These funds allowed the SCEO to sustain its mission and carry out projects in FY 2007 with projected lifetime savings of \$16.5 million. This means that for every dollar spent, the SCEO was able to generate a savings of more than six dollars.

Planning and Reporting: Staff completed the annual process of developing the Energy Action Plan, which outlines strategies to be utilized in pursuit of agency, state and federal priorities. Throughout FY 2007 quarterly staff meetings were held to discuss the activities and accomplishments of the previous quarter. These meetings proved extremely valuable in identifying challenges and potential obstacles to success. Information collected was used in a number of required reports including the Governor's Activity Budget and the Accountability Report. Staff also develops and submits the annual State Energy Program (SEP) Plan to the US Department of Energy as a part of its request for the SEP grant. We submit quarterly status reports detailing progress toward SEP milestones.

Measuring Savings: In FY 2007 the SCEO continued expansion and refinement of the SCEO Savings Matrix. The Savings Matrix is a complex document designed to track savings from SCEO activities in the public and private sectors. Originally created as a means of capturing savings from equipment and construction projects, the Matrix has been expanded using metrics created by the Oak Ridge National Laboratory (ORNL) to include other projects and activities that are just as beneficial but substantially more difficult to track. This year, we have added or refined our savings calculations for activities such as information dissemination, and public presentations. To date the Savings Matrix includes savings in twelve categories and tracks savings over the expected life of more than 400 projects and activities. We have estimated a total savings of approximately \$257 million for all projects.

Radioactive Waste Disposal Program

In FY 2007 we began a new project to capture and record societal benefits that do not easily translate to cost savings—improved air quality and reduction in greenhouse gas emissions. This new document, named the Benefits Matrix, draws attention to the link between energy use and air quality, and will help the SCEO respond to the USDOE’s call for states to begin tracking and reporting emission reductions in order to comply with a new federal mandate to reduce emissions by 25% over 1990 levels by 2012. The Benefits Matrix is still under construction by SCEO staff, but is expected to be fully completed in FY 2008.

Lifetime Projected Energy Savings from Selected SCEO Activities over past 12 years	
Public Sector	
State Government	\$51,360,000
School Districts	\$20,300,000
Local Government	\$10,150,000
Non-Profit	\$520,000
Workshops	\$16,500,000
Sub-Totals	\$98,830,000
Private Sector	
Residential-Other	\$240,000
Workshops	\$6,700,000
Transportation	\$4,200,000
Tech-Assistance/Audit	\$32,600,000
Information Outreach	\$1,230,000
Sub-Total	\$44,970,000
Other	
Residential-Manufactured Homes	\$113,100,000
Sub-Total	\$113,100,000
Total	\$256,900,000